CERVICAL CANCER

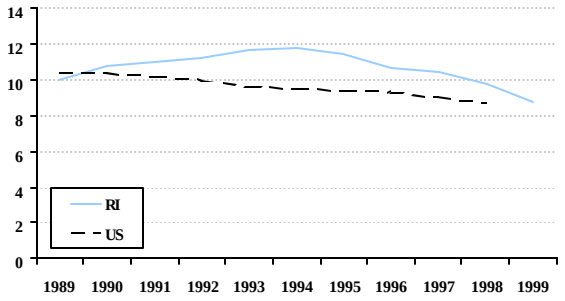
Cervical cancer originates from pre-cancerous lesions on the surface of the cervix. These lesions are known as squamous intraepithelial lesions (SIL) and are distinguished by two different grades. Low-grade SIL describes early mutations that may resolve on their own and not cause problems. However, low-grade SIL can progress to high-grade SIL, a condition in which several precancerous cells exist with severe abnormalities. Again, high-grade SIL are found on the surface of the cervix; progression into deeper tissue signifies development into cancer. High-grade SIL can be treated and therefore prevent development into cancer, however, if untreated for several months or years, they will most likely turn into cancer. As in all cancers, cervical cancer is capable of spreading to other organs of the body. (RICAN)

Cervical cancer is not among the most prevalent cancers in the state (and the nation), but it is significant for cancer control efforts, because of the effectiveness of screening with the Pap test. Among Rhode Islanders, cervical cancers accounted for just under 1% of all newly diagnosed cases (including males and females) in 1996-2000, with an annual average of 49 newly diagnosed cases in each of the five years 1997-2001. Cervical cancers accounted for less than 1% of all cancer deaths in 1996-2000 (including males and females), with an annual average of 17 deaths in each of the five years 1996-2000. In Rhode Island, approximately 621 females alive today were diagnosed with cervical cancer at some point in the past 25 years (2000). (RICR)

Cancer Rates

Figure 7-1. Cervical cancer incidence by year

Average annual invasive cervical cancer incidence rates** by year among females, RI and US, 1987 -2000***.*



* Rates are age-adjusted to the year 2000 US standard population, represent cases or deaths per 100,000 population, and are five-year moving averages.

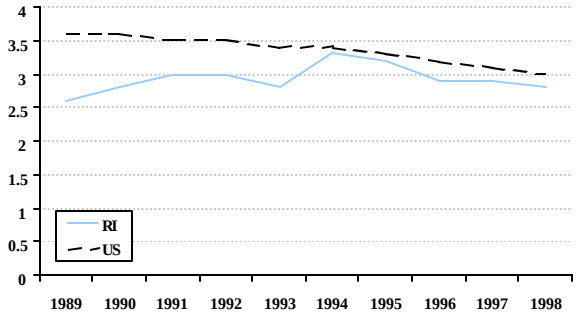
** Invasive includes the following stages of disease at diagnosis: local, regional, distant, and unknown

Source: RICR, HEALTH – calculated with *SEER*Stat*; *SEER Cancer Statistics Review, 1973-1999*; 1998 US data is from SEER Public-Use 1973-2000 Data – calculated with *SEER*Stat*.

The age-adjusted incidence of invasive cervical cancer among RI females of all races was 10.0 cases per 100,000 females in 1989, peaked at 11.8 cases per 100,000 females in 1994, then dropped to 8.8 cases per 100,000 in 1999 (based on five-year moving averages). In contrast, the age-adjusted incidence of invasive cervical cancer among US females of all races decreased from 10.4 cases per 100,000 females in 1989 to 8.7 cases per 100,000 females in 1998 (based on five-year moving averages).

Figure 7-2. Cervical cancer mortality by year

Average annual cervical cancer mortality rates by year among females, RI and US, 1987-2000**.*

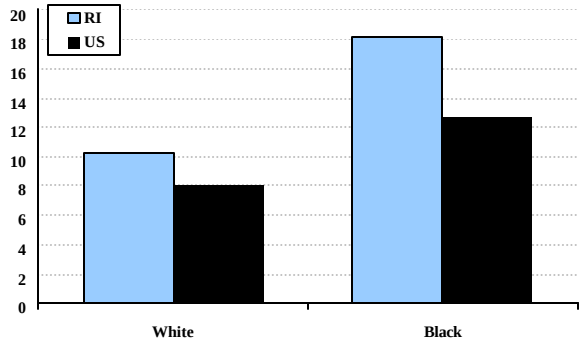


* Rates are age-adjusted to the year 2000 US standard population, expressed as deaths per 100,000 population.
** Rates are five-year moving averages.
Source: CDC WONDER, CDC; 1998 US data is from SEER US Mortality 1969-2000 Data – calculated with *SEER*Stat*.

The age-adjusted mortality of invasive cervical cancer among RI females of all races hovered around 3 deaths per 100,000 females for the entire period of observation (based on five-year moving averages). The age-adjusted mortality of invasive cervical cancer among US females of all races experienced a small but steady decline from 3.6 deaths per 100,000 females in 1989 to 3.0 deaths per 100,000 females in 1998 (based on five-year moving averages).

Figure 7-3. Cervical cancer incidence by race

Average annual invasive cervical cancer incidence rates by race among females, RI and US, 1987-2000.*



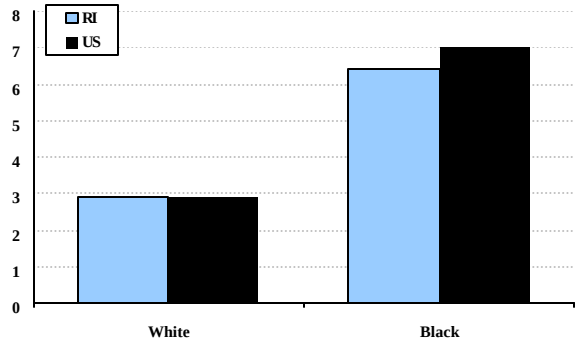
* Rates are age-adjusted to the year 2000 US standard population, expressed as cases per 100,000 population.
Source: RICR, HEALTH; SEER Public-Use 1973-2000 Data; calculated with *SEER*Stat*.

In RI, during 1987-2000, cervical cancer incidence rates were higher among black females (18 cases per 100,000) than among white females (10 cases per 100,000). This gap was similar among US black females (13 cases per 100,000) and white females (8 cases per 100,000).

[Note: RI incidence data for 2001 is currently available. US incidence data is only available through 2000. For comparability, the figure at left contains RI data through 2000.]

Figure 7-4. Cervical cancer mortality by race

Average annual cervical cancer mortality rates by race among females, RI and US, 1987-2000.*



* Rates are age-adjusted to the year 2000 US standard population, expressed as deaths per 100,000 population.
Source: Office of Vital Records, HEALTH; SEER US Mortality 1969-2000 Data; calculated with *SEER*Stat*.

In RI, during 1987-2000, cervical cancer mortality rates were higher among black females (7 deaths per 100,000) than among white females (3 deaths per 100,000). This gap was similar among US black females (6 deaths per 100,000) and US white females (3 deaths per 100,000).

Healthy People 2010 **Targets**
Mortality: By 2010, reduce the cervical cancer death rate to 2.0 deaths per 100,000 females (age-adjusted to the year 2000 standard population of the United States; baseline = 3.0 deaths per 100,000 females in 1998).

Risk Factors

According to current research, infection with human papilloma virus (HPV) is the major cause of cervical cancer. (NCI Cancer Facts, NIH Consensus) All sexually active females are at risk for developing cervical cancer. However, factors that increase risk include low socioeconomic status, history of multiple sexual partners, early onset of sexual intercourse, cigarette smoking, and infection with human immunodeficiency virus (HIV). (Clinical)

Prevention

Modification of sexual behaviors in young people and development of an effective vaccine for HPV may prevent cervical cancer. However, screening with the Pap test, is currently the most important strategy for the prevention of cervical cancer. (NIH Consensus)

Screening

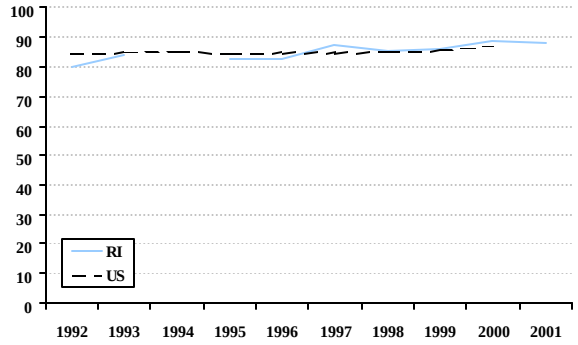
The most clinically significant strategy for the reduction of cervical cancer is use of the Pap test (Pap smear), a noninvasive, inexpensive, simple screening procedure that allows physicians to find and treat precancerous dyplasias and localized tumors. The effectiveness of screening with the Pap test for the reduction of cervical cancer mortality has been demonstrated by several studies. (HP) Although reports of high false-negative and false-positive rates have caused the accuracy of the Pap test to be questioned, the re-screening of smears and the development of computer-based automated technology have reduced the proportion of false results. (Ku)

The American Cancer Society recommends (ACS):

- All women should begin cervical cancer screening about 3 years after they begin having vaginal intercourse, but no later than when they are 21 years old. Screening should be done every year with the regular Pap test or every 2 years using the newer liquid-based Pap test.
- Beginning at age 30, women who have had 3 normal Pap test results in a row may get screened every 2 to 3 years with either the conventional (regular) or liquid-based Pap test. Women who have certain risk factors such as diethylstilbestrol (DES) exposure before birth, HIV infection, or a weakened immune system due to organ transplant, chemotherapy, or chronic steroid use should continue to be screened annually.
- Another reasonable option for women over 30 is to get screened every 3 years (but not more frequently) with either the conventional or liquid-based Pap test, *plus* the HPV DNA test.
- Women 70 years of age or older who have had 3 or more normal Pap tests in a row and no abnormal Pap test results in the last 10 years may choose to stop having cervical cancer screening. Women with a history of cervical cancer, DES exposure before birth, HIV infection or a weakened immune system should continue to have screening as long as they are in good health.
- Women who have had a total hysterectomy (removal of the uterus and cervix) may also choose to stop having cervical cancer screening, unless the surgery was done as a treatment for cervical cancer or precancer. Women who have had a hysterectomy without removal of the cervix should continue to follow the guidelines above.

Figure 7-5. Cervical cancer screening by year

Percent of female respondents, with uterine cervix, age 18 and older, who report that they have had a pap smear within the last three years, RI and US, 1992-2001.



Source: RI -BRFSS, HEALTH; BRFSS, CDC

The proportion of RI females of all races, aged 18 years and older, who had received a Pap test within the preceding 3 years increased from 80% in 1992 to 88% in 2001. Among all the states, in comparison, the median proportion of females of all races, aged 18 years and older, who had received a Pap test within the preceding 3 years increased from 84% in 1992 to 87% in 2000.

From 1989 to 1999, trends in stage-specific cervical cancer incidence rates are consistent with screening rates. When broken down by stage of disease at diagnosis, there was a small peak in the incidence of local and regional cervical tumors. There was no significant change in the incidence of distant cervical tumors and tumors of unknown stage.

[Note: Adoption of the Bethesda System for classifying cervical cytology in the late 1980s made it impossible to distinguish in situ cervical cancer from high grade cervical dysplasias. Thus, cancer case reports for in situ tumors accepted after that time must be considered suspect. Recognition of this fact led to the termination of such reports by cancer registries around the country in 1996.]

***Healthy People 2010* Targets**
Screening: By 2010, increase the proportion of females aged 18 years and older who have ever received a Pap test to 97% (baseline = 92% in 1998), and increase the proportion of females aged 18 years and older who have received a Pap test within the preceding 3 years to 90% (baseline = 79% in 1998).

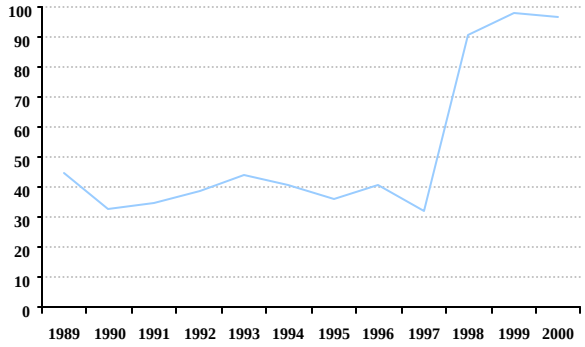
Treatment

Several treatment options for cervical cancer exist, including procedures for pre-cancerous conditions, as well as surgical and non-surgical options for cancerous conditions. Common procedures to treat pre-cancerous conditions include cryosurgery (lesions are frozen using liquid nitrogen), diathermy (heat used to destroy and remove unhealthy cells), laser surgery, loop epithelial excision procedure (electrical wire loop used to slice tissue), conization (cone-shaped sample of tissue removed), or hysterectomy. Surgical treatment options for cervical cancer include simple hysterectomy, radical hysterectomy or pelvic lymph node dissection, or pelvic exenteration (only used in advanced stages). Non-surgical treatment options include chemotherapy, radiation therapy, biological therapy, or clinical trials. (RICAN)

The percent of cervical cancer cases in RI ACOS-approved treatment programs and the percent staged with AJCC staging methodology is detailed below.

Figure 7-6. Cervical cancer in ACOS programs by year

Percent of cervical cancer cases treated in ACOS approved cancer treatment programs by year among females, RI, 1989-2000.

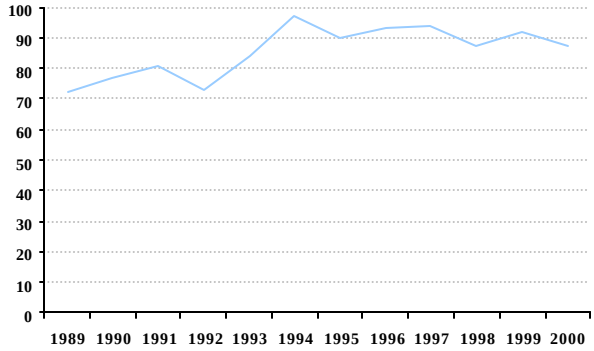


Source: RICR, HEALTH

The percent of cervical cancer case reports from ACOS approved hospital cancer treatment programs in RI remained around 40% from 1989 through 1996, and then increased dramatically from 32% in 1997 to 97% in 2000.

Figure 7-7. Cervical cancer with AJCC staging by year

Percent of cervical cancer cases staged with AJCC staging methodology by year among females, RI, 1989-2000.



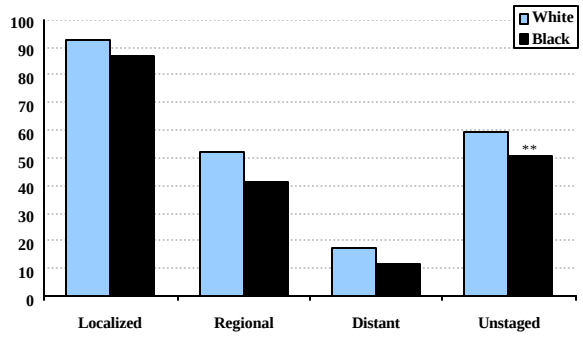
Source: RICR, HEALTH

Prior to a change in the Rules and Regulations of the Rhode Island Cancer Registry in 1992, only about 76% of the cervical cancer cases newly diagnosed among RI females were staged using the AJCC system. After the Rules change, the proportion of cases with AJCC staging increased to 84%, and has averaged 91% from 1993 through 2000.

Survival

Figure 7-8. Cervical cancer survival rates by race and stage

Invasive cervical cancer five-year relative survival rates by race and stage of disease at diagnosis among females, US, 1992-1999.*



* Survival rates are relative rates expressed as percents
** The standard error of the survival rate is between 5 and 10 percentage points.
Source: *SEER Cancer Statistics Review, 1975-2000.*

Based on US data from 1992-1999, five-year relative survival rates for cervical cancer are higher when diagnosed at earlier stages of disease, and are higher among white females than black females. Cervical cancers diagnosed while localized have a survival rate of 93% among white females and 87% among black females. Cancers that are not diagnosed until a distant stage have a survival rate of 18% among whites and 12% among blacks.

Discussion

Summary of Burden

Cervical cancers are preventable; new cases of cervical cancer and cervical cancer deaths are largely the result of failures to screen according to guidelines.

Among RI women, cervical cancer is not one of the most prevalent cancers in the state. However, it is a very important cancer to monitor, because the potential for much higher cervical cancer rates is great, absent aggressive screening for precancerous lesions with the Pap test. The annual averages of 54 newly diagnosed cervical cancer cases and 17 cervical cancer deaths are largely the result of failures to screen.

Relative Burden

The cervical cancer mortality differential between Rhode Island and the United States decreased in the 1990's.

Cervical cancer mortality was slightly lower in RI than the US throughout the 1990s, but this differential decreased over the decade.

Disparities

In Rhode Island, cervical cancer rates are higher among black women than white women.

Paralleling US experience, age-adjusted cervical cancer incidence and mortality rates in RI are higher among black women than white women. Because proper cervical cancer screening is effective in *preventing* cervical cancer by facilitating the removal of precancerous lesions, higher incidence in any group of women reflects inadequate

screening. Higher mortality also reflects inadequate screening, but may also reflect barriers to state-of-the-art therapy.

Status of Control Strategies

The burden of cervical cancer may be reduced by screening women according to guidelines and by assuring state-of-the-art treatment for all cervical cancer patients. Current screening with the Pap test is both inexpensive and effective in finding precancerous lesions, which can be removed before tumors develop. As such, the primary control strategy for cervical cancer in RI is screening for cervical cancer according to national guidelines. Another important control strategy is to assure state-of-the-art treatment for all cancer patients through improvement of basic treatment infrastructure.

Effective screening is likely responsible for low cervical cancer rates in Rhode Island.

The effectiveness of screening with the Pap test is reflected in trends of stage-specific cervical cancer incidence rates, analyzed in previous reports (Review). The low rates of cervical cancer in RI reflect very effective use of an extensive screening system.

The WCSP has helped increase the percentage of Rhode Island women who are screened for cervical cancer.

The Women's Cancer Screening Program (WCSP) aims to increase the percentage of women who receive Pap tests (and mammograms). Based at HEALTH, the WCSP provides free cervical cancer screening services for RI women who are age 50 or older (note the difference with the breast cancer screening age criterion), uninsured or underinsured, and with incomes at or less than 250% of the poverty level.

By the year 2000, almost all cervical cancer case reports in Rhode Island were from American College of Surgeons (ACOS) approved hospitals.

By the year 2000, 9 out of 10 cervical tumors in Rhode Island were staged with American Joint Committee on Cancer (AJCC) methodology.

Cancer Control Priorities for 2004

Reduce the burden of cervical cancer by maintaining current levels of cervical cancer screening.

Maintain current levels of cervical cancer screening by (a) maintaining existing infrastructure, (b) promoting use of the Pap test, and (c) reaching out to uninsured women through the WCSP.

Reduce the burden of cervical cancer by identifying existing barriers to screening.

Identify existing barriers to screening among those women not screened according to guidelines. Conduct a careful analysis of the unscreened population using BRFSS and RI-HIS data. Search for common characteristics that may identify target audiences and effective interventions.

Reduce the burden of cervical cancer by increasing the proportion of cervical cancer patients who receive state-of-the-art treatment.

Begin to eliminate disparities by identifying reasons for disparities in relative mortality between white women and black women.

Identify reasons for disparities in relative mortality between white and black women. Conduct a careful analysis of racial differentials using the Rhode Island Cancer Registry, the Behavioral Risk Factor Surveillance System, the Rhode Island Health Interview Survey, and death certificate data. Investigate variables such as socioeconomic status and stage-specific incidence rates among white and black women.